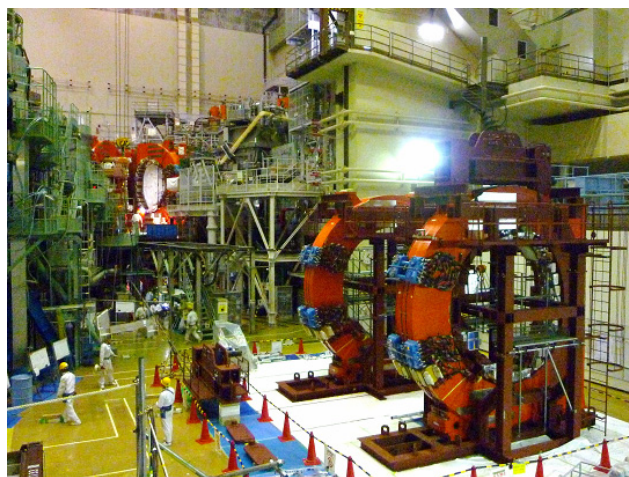
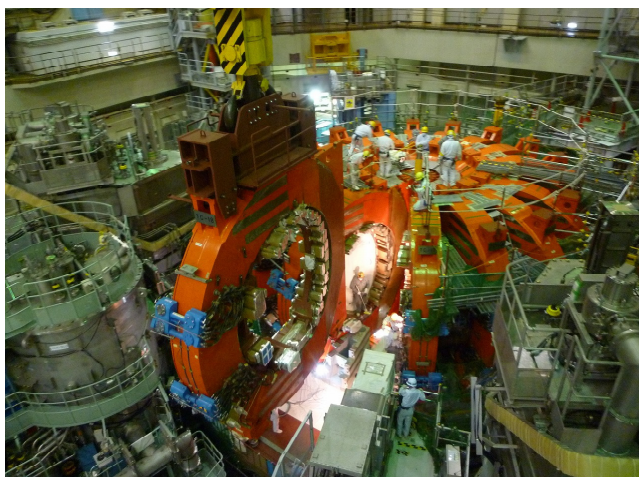


Headline

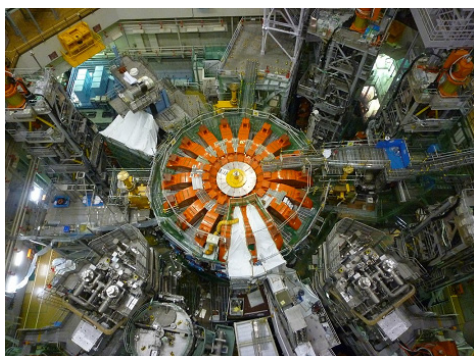
Disassembly of toroidal field coil



Disassembly of the toroidal field coils has just begun at the JAEA Naka site. A 40° sector of the vacuum vessel was cut, and temporarily fixed to the vacuum vessel itself. The equilibrium field coils at that section were also cut with a diamond wire saw. The first of the eighteen toroidal field coils (90 t per coil) was then removed with the cut parts of the equilibrium field coils. By the end of December 2011, two of the toroidal field coils were removed, and temporarily stored in the assembly hall, next to the torus hall, with stands. The removed toroidal field coils will be re-assembled in sequence on the upper support structure in the JT-60 storage building at the site.

The toroidal field coils, composed of water cooling copper conductors and producing a maximum toroidal field of 4.5 T at a major radius of 3.03 m, have played an important role in the JT-60 experiment from its beginning in April 1985 until its end in August 2008. During these years, JT-60 achieved great results including the world record ion temperature, 520 million Kelvin, in 1996.

The eighteen coils, once removed from JT-60 and reassembled in the form of a torus in the storage building, will stand as a monument to this success for future generations.



JT-60 before removal of toroidal field coils



View from inside the vacuum vessel

News

Disassembly of positive ion neutral beam injection system



Last tank for heating system removed

In December 2011, disassembly of the positive ion neutral beam injection (P-NBI) system was completed, and the last of five tanks for the heating system was successfully removed from the torus hall to the motor-generator building at the JAEA Naka site.

There is a long history to the P-NBI system. Back in 1986, the plasma heating experiment in JT-60 was started with the P-NBI heating system using a hydrogen beam with a duration of 10 seconds. At that time, there were fourteen units for the system, and injection angles of the beam lines to the magnetic axis were nearly perpendicular. In 1991, the injection angles from four units were changed when JT-60 was upgraded to JT-60U. Two of these units were reorientated to the co-direction and the other two units to the counter-direction with respect to the plasma current direction. At the same time, the beams were also changed to high energy deuterium. In 1997, three lower units out of ten for nearly perpendicular injection became unused in order to use the ports for divertor pumping, when the divertor was modified to the W shaped divertor. As a result, the eleven remaining units in total were used for the heating system. In 2002, it became possible to inject the beams for 30 seconds with the tangential units due to prolongation of the JT-60 discharge duration up to 65 s.

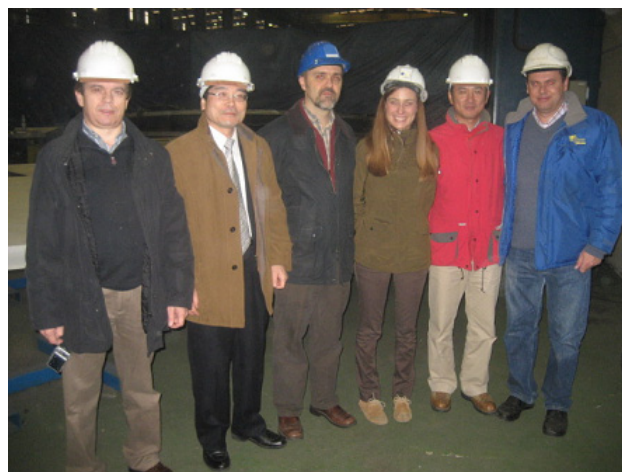
During these 22 years, the P-NBI heating system has made significant contributions to the heating experiment right up to the time that JT-60 completed its operation in 2008, and the disassembled and removed P-NBI system will be used once again for the new experiment with JT-60SA.

News

Fabrication of cryostat base making steady progress



Bottom of internal cylindrical shell



IDESA team and experts from EU and JA Home Teams

CIEMAT will supply most of the cryostat for JT-60SA, implementing the Procurement Arrangements between JAEA and F4E in two contracts. The first one devoted to the cryostat base is being carried out while the second one will soon be placed for the supply of the cryostat vessel body.

For the cryostat base, after the transfer of the contract from Felguera Construcciones Mecánicas (the original company awarded with the contract) to IDESA, the latter has provided the human and material resources necessary to advance in the manufacturing. After the delivery of the base material by Outokumpu, the cutting and bevelling of all pieces have been done by external subcontractors and the manufacturing at IDESA's workshops has really begun at the end of August 2011. Today the manufacturing of the lower structure is well advanced.

The nine individual radial beams of the lower structure have been welded, and are almost finished. These beams will soon be assembled together to form the three lower sectors. The final machining of these sectors will start in the middle of February, at the ASTURFEITO workshop, which is the subcontractor that will provide the final machining and assembly of the whole cryostat base. Up to now, the tolerances are within the specified ones.

The manufacturing of the double ring sectors is also progressing well. The upper and lower horizontal plates are assembled, and most of the butt welds between the different pieces have been completed. All the ribs of the double rings have been bent, and are ready to be assembled, and welded between plates. This assembly is the most complicated one, and will be performed with special care.

The inner cylinder is also under fabrication. It probably is the easiest component to be fabricated. The forgings for the toroidal field coil supports, and bolts are under procurement.

With the present manufacturing status the cryostat base will be delivered to Japan as planned, in December 2012.



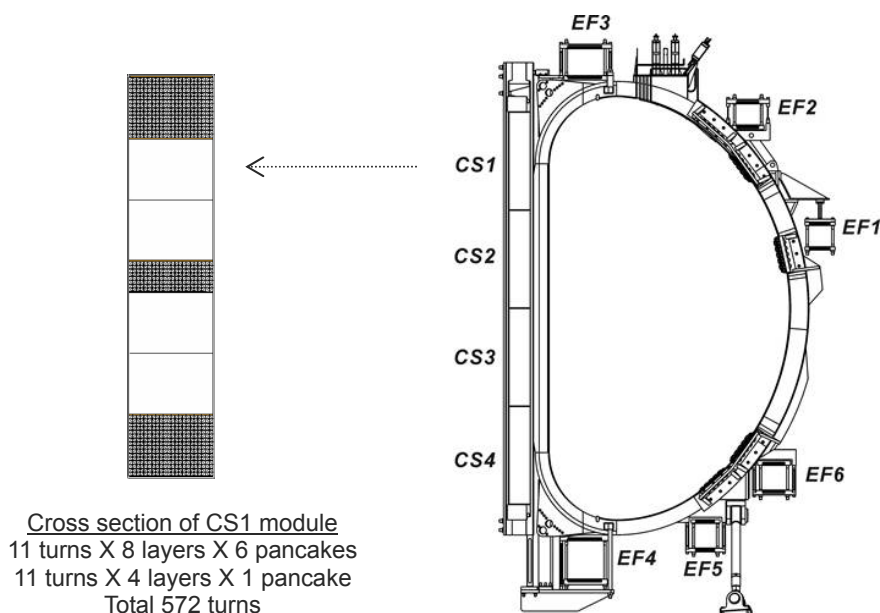
Part of rigid radial leg



Part of large double ring

News

Progress of poloidal field coils: manufacturing of conductors for CS-1 completed



The sixth Nb₃Sn conductor 466 m long was manufactured for the central solenoid (CS) 1 module, and all the conductors required for the CS1 are now all ready. A tensile test at very low temperature of 4 K was performed for the CS jacket, and met its specification. As for the equilibrium field coil No.4, its ten pancakes were completed, and the process of forming the coil using the pancakes has just begun.

News

Fabrication of upgraded inverter board progressing well

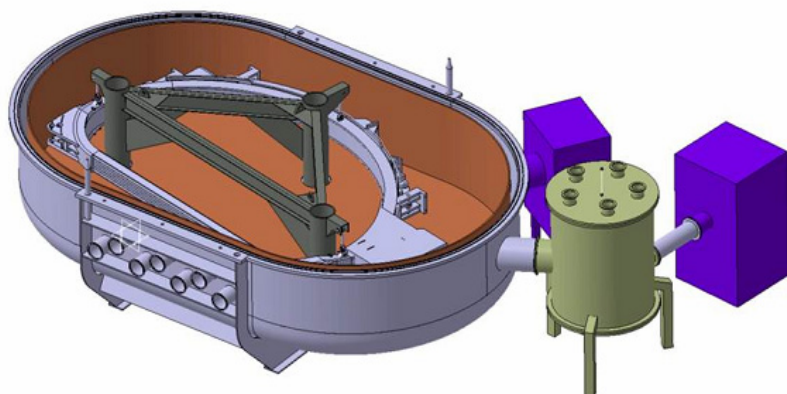


IEGT element stack (left) and diode stack (right)

For the upgraded inverter board to be installed in the upgraded inverter building at the JAEA Naka site, manufacturing of its main components such as the injection enhanced gate transistor (IEGT) element stack, diode stack, and their snubber circuits is progressing well.

News

Procurement arrangement for toroidal field coil test facility concluded



Toroidal field coil test facility with toroidal field coil inside

The Procurement Arrangement for the setup of “a Cryogenic Test Facility and the Performance of Tests of the Toroidal Field coils for the Satellite Tokamak Programme” was concluded in January 2012.

According to this Procurement Arrangement, SCK•CEN will manufacture the test cryostat, valve box vessel, and test frames, and CEA will set-up the test facility, integrate the helium refrigeration system and valve box, and perform the tests (see Newsletter No.22).

The infrastructure at the new site for the test facility at CEA Saclay in France is being prepared. CEA will modify and relocate an existing helium refrigeration plant, and upgrade existing power supplies. After some modifications, new tests have been performed with the existing refrigerator to prove that it can provide the required capacity. SCK•CEN has continued construction of the cryostat at the ALM company premises. Acceptance testing of the cryostat is scheduled for February 2012 with subsequent delivery to CEA at the Saclay site.

Meetings

Technical progress meeting on cryogenic system held in Naka



From 10 to 13 January 2012, cryogenic experts from JAEA, CEA and F4E met at the JAEA Naka site to discuss open issues of the design of the cryogenic system and to review the progress of the ongoing competitive dialogue with potential suppliers.

Major topics of the meetings were the conditions and constraints for the companies performing the on-site work, questions raised by industry involved in the competitive dialogue, special issues related to the design of the cooling water system, the application of codes and standards, and the transportation of the components to the Naka site. In addition to the main topics many other small cryogenic topics could be clarified and resolved in a very efficient way during ad-hoc discussions just across the table. At the end of the three intense working days, all participants were satisfied with the results and appreciated the friendly and cooperative spirit during the discussions.

Calendar

March 28, 2012
10th Meeting of the STP Project Committee (PC-10)

April 18-19, 2012
14th Technical Coordination Meeting (TCM-14)
Naka, Japan

April 24, 2012
10th Meeting of the BA Steering Committee (SC-10)
Naka, Japan

May 14-18, 2012

International Cryogenic Engineering Conference 24-International Cryogenic Materials Conference 2012

(CEC 24 - ICMC 2012)

Fukuoka, Japan

July 2-6, 2012

39th European Physical Society Conference on Plasma Physics & 16th International Congress on Plasma Physics

(EPS/ICPP)

Stockholm, Sweden

Contact Us

The JT-60SA Newsletter is released monthly by the JT-60SA Project Team.

Suggestions and comments are welcome and can be sent to masayasu.sato@jt60sa.org.

For more information please visit the website: <http://www.jt60sa.org/>